2-1 Patterns and Inductive Reasoning
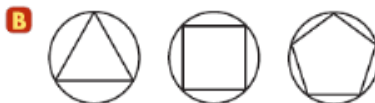
<u>Inductive reasoning</u> is reasoning based on patterns you observe.

© **Problem 1** Finding and Using a Pattern
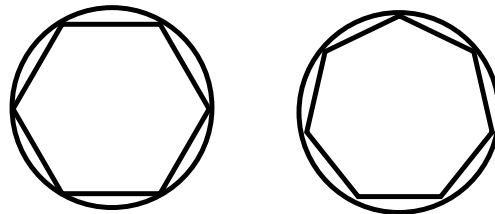
Look for a pattern. What are the next two terms in each sequence?

A 3, 9, 27, 81, . . .

✱3

243, 729

B △ ▢ ⬠

add a side to
the shape inside
the circle

a. 45, 40, 35, 30, . . .

−5

25, 20

A **conjecture** is a conclusion you reach using inductive reasoning.

Ⓒ **Problem 2**   **Using Inductive Reasoning**

Look at the circles. What conjecture can you make
about the number of regions 20 diameters form?

$d \cdot 2 = r$

d	1	2	3	...	20
r	2	4	6	...	40

20 diameters gives 40 regions

Problem 3 Collecting Information to Make a Conjecture

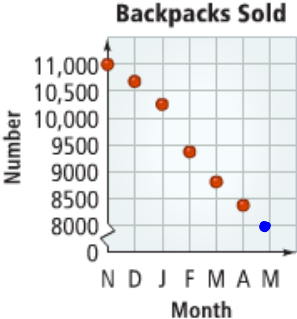What conjecture can you make about the sum of the first 30 even numbers?

work	sum	# of terms
2	2	1 (2)
2+4	6	2 (3)
2+4+6	12	3 (4)
2+4+6+8	20	4 (5)
2+4+6+8+10	30	5 (6)
⋮		⋮
2+ ⋯ ⋯ +60 ?		30 (31)

930

© **Problem 4** **Making a Prediction**

Sales Sales of backpacks at a nationwide company decreased over a period of six consecutive months. What conjecture can you make about the number of backpacks the company will sell in May?

Backpacks Sold

Number vs Month (N D J F M A M)

11,000
10,500
10,000
9500
9000
8500
8000
0

Month

8000
back packs

A <u>counterexample</u> is an example that shows that a conjecture is incorrect.

Problem 5 **Finding a Counterexample**

What is a counterexample for each conjecture?

a. If a flower is red, it is a rose.
b. One and only one plane exists through any three points.
c. When you multiply a number by 3, the product is divisible by 6.

a. tulips, poppy

b. points can't be collinear

c. $3 \cdot 3 = 9$ $9 \div 6 = 1.5$

$3 \cdot 1 = 3$ $3 \div 6$
$3 \cdot 9 = 27$

Name

2.1

pg. 85-87 # 6-32 even

33-37

38-48 even

53

Notes 2.2